DIRECT INVESTIGATION REPORT

WATER METER READING
AND BILLING SYSTEM

September 2011

Office of The Ombudsman

Hong Kong

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Executive summary

Direct Investigation
Water meter reading and billing system

Introduction

WSD bills consumers normally on the basis of the consumption figures recorded during meter readings. Where actual or accurate readings cannot be obtained due to reasons such as meters being defective or inaccessible, bills will be issued based on estimated consumption. In the case that a defective meter has to be replaced, WSD will examine the need to adjust the water bill(s) for the defective period.

2. WSD received 7,359 complaints about water bills and charges in 2010/11. One of the reasons for complaint was that the consumers felt aggrieved that WSD presented them with bills to account for adjustments made in respect of defective periods long ago, with little proof or information as to why and when the meters were found defective, and often with scant information as to how the adjustments were calculated.

3. Against this background, The Ombudsman initiated, on 10 November 2010, a direct investigation under section 7(1)(a)(ii) of The Ombudsman Ordinance, Cap. 397, to examine WSD's arrangements for reading meters, billing customers, replacing and testing defective meters, and adjusting bills, with a view to identifying areas for improvement.

WSD procedures and practices

4. The key activities in the process of meter reading, handling of defective meters and issue/adjustment of bills are given below.

(a) Meter reading

5. Routine meter readings are conducted by Meter Readers ("MR"), who read meters on site and input relevant data into their Personal Digital Assistants ("PDA"). A complete "Reading Data" comprises two elements:

- the reading as measured by the meter; and

- where irregularities are observed, a Meter Reader Remark Code ("MR code") and additional remarks (if any).

(b) Uploading of Reading Data onto Customer Care and Billing System ("CCBS")

6. At the end of each day, the Reading Data is uploaded from the PDAs onto WSD's computer system known as CCBS.

(c) Issue of bills and orders

7. On the basis of the reading and, where applicable, the MR code, CCBS will issue:

- a bill to the consumer; and

- where appropriate, a works order to WSD staff for rectification action, such as meter replacement.

8. There are a total of 61 MR codes to denote the various irregularities observed and trigger different follow-up actions on CCBS. These codes are given in **Annex 1**.

(d) Replacement and testing of meters

9. When a meter is observed or suspected to be defective, one of the defective-related MR codes will be recorded, triggering an order for replacement.

10. Not all replaced meters are tested before disposal. For the 42,553 meter replacements triggered by the MR codes in 2010/11, tests were only conducted on 37,130 meters (87%). WSD's general rule on meter testing is:

i. Testing will be carried out on the replaced meter if the MR finds its accuracy to be doubtful and enters an appropriate MR code.

ii. No test will be conducted on the replaced meter if the MR observes it to be defective and enters an appropriate MR code.

11. This rule is built into CCBS through the use of MR codes. However, it is not accurately reflected in WSD internal instructions. For example, a sample letter for notifying consumers of bill adjustments provided in Customer Accounts Section Instruction No. 1/2008 states that "the (replaced) meter was tested in (WSD's) laboratory and found defective" – this

is not appropriate as a fair proportion of replaced meters are not tested.

(e) Adjustment of bills

12. After defective meters are replaced, WSD staff will observe the consumption pattern for a period of time and adjust the bills for the defective period where appropriate. WSD should notify the consumer of the adjustment within six weeks after meter testing or after routine meter reading is available. Where original bills have already been issued or where the adjustment period is three billing periods or more, WSD should issue an explanatory letter to the consumer. Otherwise, WSD will simply issue the adjusted bill with explanatory notes. The consumer is given an opportunity to respond if he finds the adjustment unwarranted.

Staff instructions

13. Details of the meter reading, billing and adjustment arrangements are set out in WSD Departmental Instruction 2004 (Revised in December 2010). The previous version of this instruction was issued in July 1998. The greater part of the instruction has become obsolete since the commissioning of CCBS in 2005. Although various manuals/handbooks were updated from time to time, the department took five years to revamp and update this obsolete instruction.

Training and monitoring of MRs

14. It can be noted from **paras. 5 to 10** above that the whole process of meter reading, billing and follow-up rectification is a highly automated one. Under this highly automated system, it is MRs' direct responsibility to input correct and accurate Reading Data into CCBS. In training MRs, WSD places much emphasis on verbal and onsite briefings, and less on written guidelines and instructions. For example, on the use of the 61 MR codes, MRs are only given a two-page Meter Reader Remark Code Inputting Instructions ("MRRC Instructions") (**Annex 1**) containing the description of the MR codes in Chinese and English. It is WSD policy that MRs are only required to use the MR codes to record their observations. They do not need to know the implications of the MR codes.

15. The performance of MRs is monitored by Senior MRs. Their monitoring tools include spot checks (rate of spot check in 2010/11 was 0.77%) and performance reports. From our interviews with MRs, we note that accuracy in inputting readings is monitored closely – any inaccuracy of readings will be reflected in appraisal reports; in contrast,

accuracy of MR code input is not given the same degree of attention.

System checks

16. To ensure appropriate bills and actions are triggered on CCBS, there are a number of system checks, including:

a. **PDA Warnings**: The PDA gives Negative, Zero and High/Low Warnings to alert the MR to carefully check his input again. In the case of Zero Warning, the MR is required to observe whether the zero consumption is genuine or the meter is defective, and to input an appropriate MR code to trigger a corresponding follow-up action.

b. **CCBS High/Low Check**: After the Reading Data is uploaded onto CCBS, the system will perform a High/Low Check before adopting the readings for billing purposes.

- If the reading fails the pre-set low rules, CCBS will still issue a bill, and, depending on other predefined factors, may issue an order for meter replacement.

- If the reading fails the pre-set high rules and depending on other predefined factors, CCBS may hold up the bill and issue an order for special reading or bring the case to the attention of WSD staff for a review.

17. It can be noted that under the rules of the CCBS High/low Check, most low consumption cases are handled automatically by CCBS. They are brought to the attention of WSD staff at a late stage - only where meters are replaced and tested and after the test results are available.

Making changes to CCBS

18. Since the commissioning of CCBS in 2005, WSD has been making changes to CCBS from time to time to enhance its performance and to rectify system inadequacies.

19. As at end June 2011, 108 changes to CCBS had been completed and 29 were outstanding. On average it took 11 months to implement a change to CCBS. The quickest change took less than one month and the longest took 54 months.

20. Much of the work on CCBS changes was held up during mid 2010 to mid 2011 due to a major upgrading exercise of CCBS. During that period only urgent and high priority changes were made. As at end of June 2011, all enhancements and rectifications requested after February 2009 (28 months ago) were still outstanding.

Case studies

21. We have studied over 30 cases and summarised six cases in our report to illustrate (as being illustrative of) the problems in WSD's meter reading and billing arrangements. Details of these cases are given in **Chapter 3** of the full report.

Case No.	Problems revealed
Case 1	Failure of MRs to identify a defective meter for over one year, insufficient monitoring of case progress, lack of consideration for the consumer, and site observations on defective meter not recorded.
Case 2	Failure of MRs to identify a defective meter for over two years, insufficient monitoring of case progress, and lack of consideration for the consumer.
Case 3	Inadequate system checks for defective meters, insufficient monitoring of case progress, lack of consideration for the consumer, problems in communicating with consumers, and site observations on defective meter not recorded.
Case 4	Inadequate system design for using consecutive input of the same code, long time to rectify system design inadequacy to trigger action, and insufficient monitoring of works orders.
Case 5	Inadequate system design for using consecutive input of the same code to trigger action, unsatisfactory interface between CCBS and users, insufficient monitoring of case progress, lack of consideration for the consumer, and problems in communicating with consumers.
Case 6	Inadequacy in estimation logic for new accounts, and long time to rectify system inadequacy.

Observations and opinions

22. WSD's regular monitoring programme shows that in 2010/11, 5% of the in-service meters selected for testing failed its accuracy rule. By projection 138,000 of the 2.8 million

in-service meters in the territory may be inaccurate or defective. This is a cause for concern. Any deficiency in dealing with defective meters and related bill adjustments warrants serious attention.

23. In the cases studied, WSD had reasons to initiate bill adjustment. WSD is authorised under regulation 31 of the Waterworks Regulations, Cap. 102A to issue or adjust water bills on the basis of estimates when “the consumption for any period during which a meter is known **or suspected** to be out of order”. In practice, WSD will observe the consumption pattern after meter replacement and establish the need for adjustment before initiating action, and the consumer will be given an opportunity to explain the consumption pattern if he considers the adjustment not warranted.

24. However, the manner in which such actions were carried out, particularly the long time taken over the cases and the lack of consideration for the consumer, was a source of much aggravation and frustration among the complainants, and there is much room for improvement.

25. WSD makes use of a highly automated system to support its meter reading and billing process. We do not question that a highly automated system is necessary for handling the huge number of accounts WSD has to serve. However, the proper functioning of such a system relies heavily on the proper operation of all the inter-dependent links in the chain of activities, including correct and timely input, sufficient system checks, faultless system design, seamless interface between CCBS and WSD staff, and efficiency in rectifying system inadequacies once revealed. Weakness or deficiency in any one link can trigger, through the system, outcomes that could lead to highly undesirable and, at times, absurd consequences.

26. We have identified the following deficiencies in the way WSD handles meter reading, defective meters and issue/adjustment of bills.

(a) Insufficient staff training and monitoring in meter reading

27. The long time taken in identifying defective meters is a major source of problems in adjusting bills. Under the WSD system, there are two main ways of identifying defective meters: observations made by MRs during meter reading and system checks such as the PDA Warnings and the CCBS High/Low Check.

28. **Cases no. 1** and **2** illustrate MRs’ failure in identifying defective meters as such. Our analysis has shown that the training/guidance given to MRs in this aspect is limited (**para. 14**) and monitoring by supervisors insufficient (**para. 15**). We doubt the WSD policy of not

requiring MRs to know the implications of the MR codes which are used by the system to automatically trigger follow-up actions (**para. 14**). In a system where an MR code will trigger a whole chain of outcomes, such compartmentalised mentality in training and guiding MRs can only lead to trouble.

29. WSD introduced some improvements in June 2010 to assist MRs by adding new MR codes to record observations about vacant premises, which indirectly help to distinguish cases of defective meters. However, the improvements are not thorough, and, as revealed in our interviews with MRs, their implementation inconsistent among different staff. Further enhancement in staff training and monitoring is needed.

(b) Insufficient system checks for identifying defective meters

30. Apart from observations made by MRs, another way of identifying defective meters is the built-in checks in the system. These built-in system checks include the PDA Warnings and the CCBS High/Low Check..

31. **Case no. 3** is an example of how low consumption can be recorded six times without triggering any PDA Warning or action under the CCBS High/Low Check. Since then WSD has tightened the rules of the latter check. We consider that the rules of the system checks should be kept under review and tightened where appropriate.

32. Furthermore, as long periods of zero and/or low consumption are a useful warning sign for identifying defective meters, we consider that WSD should consider enhancing its checks in this respect. Possible measures to be considered include arranging special reading for repeat zero consumption readings and mounting special programmes to check all accounts with long period, say, 12 months, of zero consumption.

(c) System design inadequacies

33. The efficient running of WSD's highly automated system is heavily dependent on the proper operation of each link in the chain of activities.

34. However, as shown in **Cases no. 4, 5** and **6**, the system still contains inadequacies after years of operation, rectification is slow, and staff/computer interface unsatisfactory. **Cases 4 and 5** reveal problems in the use of consecutive inputs of the same code to trigger action, a feature which is widely used in the WSD system.

35. Furthermore, WSD statistics show the time taken to make changes to CCBS (including rectification of system inadequacies) is unacceptably long (average time taken 11 months and all rectifications requested after February 2009 have yet to be implemented (**paras. 19 and 20**). WSD should speed up the process in rectifying system inadequacies.

(d) Insufficient monitoring of works orders

36. The long time taken to implement works orders in **Cases no. 2, 4** and **5** suggests that there is inadequate progress monitoring in this regard.

37. Since 2009 WSD has introduced regular progress monitoring reports. However, **Case no. 4** (which took place after 2009) shows that there were still delays in implementing works orders. A close examination of WSD monitoring reports shows that they only set out the creation dates of the works orders but not the target completion dates. This shows that WSD further improvement is needed.

(e) Insufficient progress monitoring in adjusting bills

38. One of the frequent complaints related to bill adjustments is the long time taken by WSD to observe the consumption pattern after meter replacement before they notify consumers about the bill adjustments. This problem is illustrated in **Cases no. 1, 2** and **3**.

39. In response to our suggestion, WSD introduced a time limit on the observation time after meter replacement in mid 2010. WSD should be given credit for taking steps to improve in this area. We urge WSD to further reduce the time limit as far as practicable.

(f) Confusion and other problems about meter testing

40. WSD's general rule on testing of meters is set out in **para.10** above. However, there is considerable evidence that much confusion and even ignorance exist among WSD staff about this rule, as reflected in the inappropriate advice provided in its staff instructions (**para. 11**) and the incorrect information supplied to consumers (**Case no. 3**).

41. Apart from the issue of confusion/ignorance among WSD staff, a closer look at the WSD meter testing rule raises the question of whether it is adequate to support the subsequent bill adjustment, especially when MR code NR (Zero warning but there should be water consumption) is used. Under the WSD rule, meters replaced in connection with MR code NR are not tested. Also, when inputting this code, MRs are not required to record the reasons for judging that there is water consumption. As a result, WSD is unable to adduce

concrete evidence to prove that the meter was indeed defective when taking action to adjust bills in such cases. This is inadequate in answering consumers' queries (**Cases no. 1** and **3**) and would give consumers the impression that WSD is arbitrary and high-handed.

42. We consider that WSD should review its meter testing rule, particularly for MR code NR (Zero warning but there should be water consumption). WSD should also enhance staff training to clarify its meter testing rule.

(g) Inadequate staff instructions

43. Our analysis of WSD procedures and practice and complaint cases shows that the administration within the Department is rather loose. This is related to the inadequacy of its staff instructions and training. For example:

- Taking five years to revamp and update its Departmental Instruction No. 2004 (**para. 13**) is one example of WSD not providing its staff with adequate guidelines.

- Some of WSD's staff instructions contain inaccurate information and inappropriate advice, such as that on meter testing contained in Customer Accounts Section Instruction No. 1/2008 (**para. 11**).

- Different MRs have different interpretations and understanding of MR codes, as revealed in our interview with them.

44. With such inadequate instructions, it is difficult for WSD frontline staff to provide complete and accurate responses to customer enquiries, and in some cases, not even a reasonable service to customers. We consider that WSD should review its staff instructions with a view to providing a set of clear and comprehensive guidelines, and align the understanding of its staff with their correct interpretation through training.

(h) Lack of consideration for consumers

45. One of the stated missions of WSD is "To adopt a customer-oriented approach in services". WSD has not lived up to this mission in the way it handles bill adjustments. Examples of lack of consideration for consumers abound in the cases studied:

- WSD took an unduly long time before notifying the consumer of the bill adjustment (in **Cases no. 1, 2, 3,** and **5**).

- WSD omitted important information from its letters (**Cases no. 1** and **3**).

- WSD supplied incorrect information in its letters (**Cases no. 3**).

- In case after case (such as **Cases no. 3** and **5**) WSD relied on inconspicuous messages in its bills to communicate important information to consumers.

46. We consider that WSD should adopt a more customer-oriented approach, especially in adjusting bills, bearing in mind that consumers are invariably upset in such situations. Specifically, we suggest that WSD should consider issuing explanatory letters for all bill adjustments and presenting more clearly important messages such as those relating to meter replacement and bill adjustments.

Recommendations

47. The Ombudsman has made 12 recommendations to WSD, as set out below:

Meter reading

(1) To review the policy of not requiring MRs to know the implications of the MR codes (**para. 28**);

(2) To review the 61 MR codes with a view to simplifying them;

System checks

(3) To keep under review the rules of the system checks for identifying defective meters, and to tighten them where appropriate (**para. 31**);

(4) To consider additional measures for identifying defective meters at an early stage (**para. 32**);

(5) To review the rules and assumptions for using consecutive inputs of the same code to trigger follow-up action (**para. 34**);

Use of computer system

(6) To speed up the process in rectifying system inadequacies (**para. 35**);

Monitoring of works orders

(7) To improve in the area of progress monitoring of works orders, such as setting out the target completion dates of individual works orders in monitoring reports (**para. 37**);

Meter testing

(8) To review the meter testing rule, particularly for MR code NR (Zero warning but there should be water consumption), in order to collect sufficient evidence of defective meters to support bill adjustment (**para. 42**);

Communicating with consumers

(9) To consider issuing explanatory letters to consumers for all bill adjustments (**para. 46**);

(10) To review the design and layout of the water bill, paying special attention to the presentation of important messages to consumers (**para. 46**);

Staff instructions

(11) To review staff instructions with a view to providing a set of clear and comprehensive guidelines (**para.44**); and

Staff training and monitoring

(12) To enhance staff training and monitoring in a number of areas, including meter reading, interfacing with CCBS and communications with consumers.

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輸入抄錶員備註代碼須知
（例行抄錶適用）

Meter Reader Remark Code Inputting Instructions
(for routine meter reading)

1. 如 PDA 出現 0 讀數警號（Zero Warning），必須再三清楚核實。如讀數正確，應觀察周圍環境、搜集資料以輸入適當的代碼（如 NR, ZX 等）。若現場環境資料不足，必須輸入 ZX。所有 0 讀數必須配合輸入適當的代碼方爲完成記錄。
2. 輸入代碼應力求精準、齊全，絕不可省去不入。尤其 0 讀數的成因可有多種，必須按現場情況輸入代碼。如前所述，若無其他更適合的代碼，0 讀數的代碼應爲 ZX。
3. 如 PDA 出現過高或過低讀數警號（High-Low Warning），必須再三清楚核實。
4. 如 PDA 出現負讀數警號（Negative Warning），必須再三清楚核實。如讀數無誤及水錶安裝正確，應輸入代碼 XX。
5. 輸入由他人提供資料的代碼（如 ZW, ZT 等）時，如情況許可應同時簡單記錄資料來源，如管理員姓氏，鄰居所住單位等。
6. 如未能成功抄錶，必須輸入代碼說明原因，並盡可能向客戶發出 WWO 167B/C/D 表格。

代碼 MR Code	說明 Description		現場處理 Action on Site
ZP	危險/困難錶位	Meter in dangerous/ difficult position.	在記事紙報告情況，繪畫簡圖。
L	通道上鎖	Access locked.	嘗試要求客戶、管理員或在場適合人士協助抄錶，或在可行情況下安排於同日另約時間再行抄錶。用備註欄 / 記事紙報告情況，及記錄有助日後抄錶的資料，如客戶聯絡電話、最適合抄錶的時間等。有需要時聯絡高級抄錶員尋求指示。 在可行情況下，即時派發"無法抄錶通知書"(WWO167 表格)，並使用標準格式，記錄有關事項。 示例：L－123456（123456 爲 WWO167 編號，參閱《抄錶組外勤操作備忘》）
ZL	門鎖損壞	Access blocked by defective lock. (can be repaired in a few days)	
O	錶位受阻	Access obstructed.	
OP	喉管阻讀	Meter obstructed by pipe.	
LS	山泥阻路	Landslide near the meter position.	
MC	錶被泥掩	Meter covered by earth.	
F	錶位水浸	Meter location flooded.	
ZF	路面水浸	Road / path to meter flooded.	
PF	錶井水浸	Pit containing meter flooded.	
PJ	錶井蓋難開	Pit cover cannot be opened.	
ZE	升降機壞	Elevators out of order.	
ZD	無人綁狗	Meter guarded by dogs.	
VA	空置待租賣	Vacant with sale advertisement	需要時在備註欄 / 記事紙報告情況。
VN	空置新樓	Unoccupied new building	
VR	空置待重建	Vacant pending for redevelopment	
VT	住客稱空置	Tenant said vacant	
VV	空置村屋	Vacant village house	
VX	空置 (其他原因)	Vacant (other reasons)	
DH	屋已拆毀	Premises demolished.	嘗試抄錶。需要時在備註欄 / 記事紙報告情況。
ZB	屋已燒毀	Premises burnt.	
SD	屋待清拆	Premises to be demolished and meter cannot be reached.	在 PDA 的 eForm 記錄有關資料，例如清拆通告上負責機構的聯絡電話等。
ZT	住客稱不用	Tenant said no consumption.	在備註欄 / 記事紙記錄有關資料來源及其他事項。
ZW	看更稱公共地方不用水	Watchman said no consumption for maintenance of public/ common area	
ZG	貨倉不用	Godown of no consumption.	

代碼 MR Code	說明 Description		現場處理 Action on Site
ZN	不用水 (現場有明確原因)	No consumption (with definite reasons)	在備註欄記錄有關情況。(e.g. stop cock before meter closed / 錶前掣已關)
NR	錶不轉動 (估計有用水)	The reading triggers 0 warning in PDA but there should be water consumption.	如經現場測試，確認水錶不轉動，用備註欄記錄有關事項 (e.g. test NR)
NT	住客稱錶不動	Tenant said meter not moving	嘗試進行簡單的水錶測試
ZX	錶不轉動 (沒有資料估計有否用水)	The reading triggers 0 warning in PDA. Insufficient information to judge no consumption or not.	
RB	讀數倒行	Reading running backwards.	使用本代碼前，先表面觀察水錶是否安裝正確。
XX	負讀數	Negative Reading.	
SE	客戶報錶	Self-read.	如讀數是抄錶時現場獲得，在備註欄 / 記事紙記錄資料來源。
YY	錶號不符	Meter number different from record.	在備註欄 / 記事紙記錄有關資料。
ZU	找不着錶	Meter cannot be located.	
ZO	超出範圍	Meter location out of the assigned route.	
FW	錶面向牆	Meter facing wall.	嘗試用鏡輔助抄錶。
JL	接口漏水	Leakage found at meter joints.	在備註欄記錄漏水位置（在水錶前還是在水錶後，或用記事紙繪畫簡圖記錄漏水位置。如水管爆裂或嚴重漏水，嘗試通知客戶。必要時聯絡高級抄錶員。
ML	錶身漏水	Water leaks from the meter.	
SL	喉管漏水	Water leaks from piping near meter.	
CL	錶前掣漏水	Water leaking from stop-cock.	
SB	封條破損	Seal broken.	
GB	玻璃破損	Meter glass broken / blocking the dials or pointers.	
GO	玻璃模糊	Water vapour masked the meter glass or lens defaced.	嘗試令水氣消散，但小心勿弄破玻璃。
MI	錶號模糊	Unclear meter number.	使用標準格式，記錄有關事項。 示例：HI – 456789aaaaa0（參閱《抄錶組外勤操作備忘》） 或用記事紙繪畫簡圖記錄有問題部份
HI	指針不正	Dials / pointers not in correct positions.	
HM	指針缺失	Dials / pointers missing.	
ID	錶盤骯髒	Dirt covering the dials / pointers.	
LM	錶蓋遺失	Meter lid missing.	只適用於有錶蓋及錶蓋上有水錶號碼的水錶型號，其他水錶型號不必輸入此代碼。
MD	水錶損毀	Meter damaged.	如損壞情況可用其他代碼更清楚記錄，不應使用此代碼。
MR	錶被拆走	Meter removed from the pipe.	在備註欄 / 記事紙報告情況。
MP	資料不確	Wrong meter particulars including meter type and size.	用 PDA 的 eForm 記錄有關資料。
MQ	數位錯誤	Wrong meter dials.	
WA	水錶錯置	Wrong meter arrangement.	使用本代碼前，嘗試測試用水，並在備註欄 / 記事紙報告情況。
WF	水錶倒裝	Meter fixed in the reverse direction.	
SP	內喉已封	Water supply plugged but meter still remains.	
WM	無錶用水	Supplies given without meter.	用記事紙報告情況，並繪畫簡圖。
ZC	不用水 相連單位	No consumption record in common flats.	在備註欄 / 記事紙記錄有關資料。
NS	用水用途 改變	Change in nature of water use.	
ZS	無來水	Meter installed with no water supplies.	在備註欄 / 記事紙記錄有關資料。
ZI	錶位受阻 (其他原因)	Meter inaccessible due to special reasons.	使用本代碼時須向高級抄錶員徵詢意見。在備註欄 / 記事紙記錄報告情況。
SR	特別原因 (內部用途)	Special reasons – internal official use.	

1

INTRODUCTION

BACKGROUND

1.1 One of the main duties of the Water Supplies Department ("WSD") is to operate and maintain a water supply system for the community at a charge to consumers. In discharging this duty WSD conducts meter reading and issues bills on the basis of the readings. Where actual or accurate readings cannot be obtained due to such reasons as meters being defective or inaccessible, bills will be issued based on estimated consumption. In the case that a defective meter has to be replaced, WSD will examine the need to adjust the water bill(s) for the defective period.

1.2 WSD received 7,359 complaints about water bills and charges in 2010/11. One of the reasons for complaint was that the consumers felt aggrieved that WSD presented them with bills to account for adjustments made in respect of defective periods long ago, with little proof or information as to why and when the meters were found defective, and often with scant information to how the adjustments were calculated. As the adjustment periods were quite some time ago, they also found it difficult to contest the adjustments with sufficient evidence, and this was unfair to them.

SCOPE

1.3 On 10 November 2010, The Ombudsman initiated, pursuant to section 7(1)(a)(ii) of The Ombudsman Ordinance, Cap. 397, a direct investigation into WSD's arrangements for reading meters, billing customers, replacing and testing defective meters, and adjusting bills, with a view to identifying areas for improvement.

METHODOLOGY

1.4 In the course of this investigation, we studied relevant papers, statistics and case files of WSD. Members of the public were invited to give comments and suggestions between 10 November 2010 and 13 December 2010. We interviewed some of WSD's meter reading staff in December 2010. We also consulted two public utility service providers, The Hong Kong and China Gas Company Limited and CLP Power Hong Kong Limited in January and February 2011 respectively, on how they undertook meter reading duties.

REPORT

1.5 We sent the draft investigation report to WSD for comment on 19 July 2011. This final report, incorporating the comments of WSD, was issued on 9 September 2011.

2

PROCEDURES AND PRACTICES

2.1 This chapter examines WSD procedures and practices for:

- reading meters and billing consumers;
- replacing and testing defective meters;
- adjusting water bills for defective period; and
- making changes to its computer system known as the Customer Care and Billing System ("CCBS").

READING METERS AND BILLING CONSUMERS

The process: an overview

2.2 An important element of WSD's water supply system is its billing system for water consumption. The key activities in this billing system are as follows:

a. installing a water meter to measure the consumption of each consumer account;

b. reading the meter (normally at four monthly intervals)[1];

c. where no irregularity is observed, issuing a bill to the consumer on the basis of the actual reading;

d. where irregularities are observed (such as the meter is inaccessible or suspected to be defective), issuing an estimated bill and taking rectification action (such as meter replacement) as appropriate; and

e. after a defective meter is replaced, adjusting the bill for the defective period where warranted.

Organisation and responsibilities

2.3 The above activities are undertaken mainly by the Customer Services Branch of WSD headed by Assistant Director/Customer Services. The division of responsibilities among the different units in the Branch is broadly as follows:

1. Customer Services Division

1.1 Meter Reading Section: responsible for meter reading. There are a total of 155 Meter Readers ("MR") in the Section, comprising five Chief MRs, eight Senior MRs, 53 MR1s and 89 MR2s.

1.2 Districts Sections: responsible for field activities including inspections and meter replacement.

1.3 Customer Contact Section: responsible for operating the Customer Telephone Enquiry Centre.

1.4 Customer Services Section: responsible for operating the Customer Enquiry Centres and the Document Management Centre.

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[1] *Of the 2,756,919 meters in Hong Kong, about 2,752,419 meters (or 99.84%) are read at four-monthly intervals while about 4,500 meters (0.16%) belonging to high-consumption accounts are read at monthly intervals. 20 meters are read automatically under a pilot scheme on remote meter reading.*

2. <u>Customer Accounts Section</u> ("CAS"): responsible for collection of water charges and all billing matters.

3. <u>Technical Support Unit</u>: responsible for providing technical support services, including CCBS user support services, to the rest of the Customer Services Branch.

The process in detail

2.4 Routine meter readings are conducted by MR2. The MR2 reads the meter on site and inputs the data into his Personal Digital Assistant ("PDA"). A complete "Reading Data" comprises two elements:

- the reading as measured by the meter; and
- a Meter Reader Remark Code ("MR code") and additional remarks (if any), where irregularities are observed.

2.5 At the end of each day, the Reading Data is uploaded from the PDAs onto CCBS, which has been programmed to take the following actions automatically upon receipt of the Reading Data:

- issue a bill to the consumer; and
- where appropriate, issue a works order to WSD staff for rectification action, such as meter replacement.

2.6 It can be noted that the whole process of meter reading, billing and follow-up rectification is a highly automated one underpinned by CCBS.

Use of MR codes for irregularities

2.7 The great majority of routine meter readings are straightforward cases with no irregularities observed. In 2010/11, of the 8,365,610 routine meter readings taken, irregularities were observed in only 323,366 (or 3.9 %) cases. There are 61 different MR codes used by WSD to record irregularities for future reference and to trigger automatic actions on CCBS. A full list of these codes is given in **Annex 1**. According to WSD, these 61 MR codes fall broadly into four categories by type of irregularity:

Type of irregularity	Actions triggered on CCBS[2]	Bill adjustment after rectification of irregularity
1. **Inaccessible** cases, comprising 20 codes, e.g. L (Access locked) O (Access obstructed) *56,000 cases in 2010/11 (or 17% of cases involving irregularities)*	Billing for current period: CCBS will issue estimated bill. Rectification action: ● Where WSD is responsible for rectification, CCBS will issue works order. ● Where consumer is responsible for rectification, WSD will notify consumer. If the same code is recorded for four consecutive times, CCBS will issue order for special reading. After the fifth consecutive time, CCBS will issue order for inspection.	No adjustment will be made. WSD considers that any inaccuracy in estimation will be eventually corrected upon obtaining actual readings in the next round of meter reading.
2. **Defective** cases, comprising 12 codes, e.g. NR (Zero warning but there should be water consumption) RB (Reading running backwards) *32,021 cases (or 10%) in 2010/11*	Billing for current period: CCBS will issue estimated bill. Rectification action: CCBS will issue works order for meter replacement. Some orders are issued when the same code is recorded twice consecutively.	After meter replacement, WSD will consider the need to adjust bill for the defective period.
3. Zero consumption cases, comprising 10 codes, e.g. VA (Vacant with sale advertisement) VX (Vacant – other reasons)	***3.1 For MR code ZX (zero warning but insufficient information to judge whether or not there was consumption)*** Billing for current period: CCBS will issue zero bill and invite consumer to explain the reasons for zero consumption.	3.1 After meter is replaced and tested under ZX, WSD will adjust bill for the defective period where warranted.

[2] *The actions given in this table represent the typical actions triggered by the MR codes of different categories on CCBS. There are exceptions under each category, e.g. when LM (Meter lid missing) under Defective category is recorded, CCBS will issue bill based on actual readings and works order for meter replacement; and there is no need for bill adjustment after rectification action.*

144,341 cases (or 45%) in 2010/11	<u>Rectification action:</u> Meter will be replaced and tested after third consecutive ZX. ***3.2 For MR codes other than ZX*** <u>Billing for current period</u> Zero bill (though generated) will not be sent to customers for saving of paper. <u>Rectification action</u> No action will be taken.	 3.2 No adjustment will be made.
4. Other cases, comprising 19 codes, e.g. JL (Leakage at meter joints) ML (Water leaks from the meter) *90,954 cases (or 28%) in 2010/11*	<u>Billing for current period:</u> CCBS will issue bill based on actual readings. <u>Rectification action</u>: CCBS will issue works order for rectification.	No adjustment will be made as bills are based on actual readings.
Total no. of cases involving irregularities: *323,366 cases (100%) in 2010/11*		

Training/guidance of MR2s

2.8 It is MR2s' direct responsibility to input correct and accurate Reading Data into CCBS. Each MR2 is responsible for 400 to 500 routine meter readings per day. The basic entry qualification for an MR2 is completion of Form 4 education. In training MR2s, WSD places much emphasis on verbal/on-site briefing and less on written guidelines and instructions. MR2s are given the following training or guidance in performing their duties:

a. A veteran MR will be assigned to give a new recruit at least five working days of on-site training; and the new recruit will then begin his work in the company of a veteran for about one week.

b. Each MR2 is given a copy of the "Manual for Meter Reader 2" (containing information mainly on administrative and practical matters such as organisation charts and uniforms) and the PDA Manual (mainly on how to use the PDA).

c. On the use of the MR codes, he is given a two-page Meter Reader Remark Code Inputting Instructions ("MRRCI Instructions") (**Annex 1**) containing the description of the MR codes in Chinese and English. Other relevant guidelines are circulated to all MRs on a half-yearly basis. It is noteworthy that the MR codes in MRRCI Instructions are not given in any logical order (e.g. neither alphabetical nor by type as in **para. 2.7**). Also the instructions do not contain any information on the implications of the MR codes, i.e. what follow-up actions will be automatically triggered on CCBS. In response to our inquiries, WSD explained that the current list of MR codes has been developed by incremental amendments to a historical list – hence the apparent lack of logical flow. WSD also explained that their policy in meter reading is that MR2s are only required to use the MR codes to record their observations. They do not need to know the implications of the MR codes.

d. Under MRRCI Instructions, where an MR code is considered insufficient to record the site conditions, the MR2 may add remarks either on paper or onto his PDA. However, the instructions only **require** MR2s to put down remarks in respect of two MR codes: ZI (Inaccessible – other reasons) and SR (Special reasons – internal office use). For the other 59 MR codes, MR2s are merely **advised** to put down remarks where necessary. From our interviews with Senior MRs and MR2s, it is noted that remarks are mainly used by them to record information relating to accessibility of meters in order to facilitate future meter reading (e.g. telephone number of consumer where prior appointment is required).

Monitoring measures and safeguards

2.9 To ensure accurate input of Reading Data by the MR2s into CCBS, there are the following monitoring measures and safeguards:

a. The PDA gives Negative, Zero and High/Low Warnings to alert the MR2 to check his input again.

- The PDA will issue a Zero Warning when the water consumption (i.e. the difference between the current reading and the previous reading) is within 0.003 cu.m. After checking and confirming that his zero input is correct, the MR2 is required to input one of the zero-related or defective-related MR codes into his PDA to explain the reason for the zero reading. This code will trigger a corresponding follow-up action.

- The PDA will issue a Negative Warning when the current reading is lower than the previous reading. After checking and confirming that his negative input is correct, the MR2 is required to input one of the negative-related codes. This code will trigger a corresponding follow-up action.

- The PDA will issue a High/Low Warning when the reading input fails pre-set High/Low thresholds. After checking that his reading input is correct, there is no need for the MR2 to input any code in this case.

b. Senior MR monitors the performance of MR2s through the daily Routine Reading Performance Report (**Annex 2**). As can be noted from this performance report, the focus of the monitoring is mainly on the number of meters read/unread and accuracy of the readings taken (not on code entered). This is confirmed by our interviews with Senior MRs and MR2s. We have been told by these MR2s that accuracy in inputting readings is monitored closely: any inaccuracy of readings will be reflected in their performance reports; in contrast, accuracy of MR code input is not given the same degree of attention.

c. Senior MR will arrange MR1s to conduct spot checks on the work of MR2s. Spot checks are normally conducted on the next day following the routine reading. The rate of spot check in 2010/11 was about 0.77%. The MR1 will –

- if the original Reading Data inputted by the MR2 are found correct, input special code SC (Spot Check); or

- if the original Reading Data inputted by the MR2 are found incorrect, input special code ER (Error) plus the correct data, which will supersede the original data for the purpose of billing and other follow-up actions.

d. Senior MR will schedule the duties of MR2s in such a way that each meter will be read by three different MR2s in a year.

Other system checks

2.10 After the Reading Data is uploaded onto CCBS, the system will perform a two-tier High/Low Check before adopting the readings for billing purposes:

a. First tier volume check (for high and low consumption)

- If the reading fails the pre-set low rules and consumption eight months ago has been flagged as low, CCBS will issue an order for meter replacement and test and a bill containing the message that it may be adjusted in future. However, if the reading fails the pre-set low rules but consumption eight months ago has not been flagged as low, CCBS will simply issue the bill and, depending on certain predefined conditions, may flag the case as low for future reference as appropriate.

- If the reading fails the pre-set high rules, depending on certain predefined conditions, CCBS will hold up the bill and issue an order for special reading to be conducted or issue the bill with a high bill message.

b. Second tier value check (for high consumption only): If the bill exceeds the pre-set ceiling values, the case will be brought to the attention of CAS staff who will review the account and consider issuing orders such as order for special reading or inspection.

2.11 It can be noted that under the rules of the above check, most low consumption cases are handled automatically by CCBS. They are brought to the attention of WSD staff at a late stage - only where meters are replaced and tested and after the test results are available.

Performance in meter reading

2.12 WSD has set a target of 99.95% for accuracy in meter reading. In 2010/11 this target was achieved.

REPLACING AND TESTING DEFECTIVE METERS

Meter replacement

2.13 When a meter is observed or suspected to be defective during meter reading, one of the MR codes related to defective meters should be inputted, triggering an order for meter replacement.

Meter testing

2.14 Not all replaced meters are tested before disposal. For the 42,553 meter replacements triggered by the MR codes in 2010/11, tests were only conducted on 37,130 meters (87%). WSD's general rule is:

a. If the accuracy of a meter is in doubt and one of the two MR codes below is inputted, an order for replacement and testing will be triggered.

- XX (Negative reading) twice consecutively

- ZX (Zero Warning and insufficient information to judge whether or not there was consumption) three times consecutively

b. If the accuracy of the meter is in doubt and one of the three codes below is inputted, an order for inspection will be triggered. Depending on the results of this inspection, an order for replacement and testing will be issued if necessary. For RB and WF cases where there is evidence of meter tampering, the consumer will be required to bear the testing cost; otherwise, WSD will bear the testing cost.

- RB (Reading running backwards)
- WF (Meter fixed in the reverse direction)
- NT (Tenant said meter not moving)

c. If the meter is found to be defective and one of the 12 MR codes below is inputted, an order for replacement only will be triggered. No test will be carried out.

- HI (Dials/pointers not in correct positions)
- HM (Dials/pointers missing)
- ID (Dirt covering the dials/pointers)
- GB (Meter glass broken/blocking the dials/pointers)
- LM (Meter lid missing)
- MD (Meter damaged)
- ML (Water leaks from the meter)
- MI (Unclear meter number)
- CL (Water leaking from stop-cock)
- GO (Water vapour masking the meter glass or lens defaced)
- MQ (Wrong meter dials)
- NR (Zero warning but there should be water consumption)

2.15 The above rule is not accurately reflected in WSD internal instructions. For example, Departmental Instruction No. 2004 provides that after inspection all meters replaced in connection with MR codes RB and WF are to be tested at the cost

of the consumer – this is not entirely consistent with the rule in para. 2.14 (b) above. A sample standard letter for notifying consumers of bill adjustments provided in CAS Instruction No. 1/2008 states that "the (replaced) meter was tested in (WSD's) laboratory and found defective" - this is not appropriate as a fair proportion of replaced meters are not tested.

Monitoring of orders for replacement and testing

2.16 WSD has introduced monthly reports to monitor the progress of its works orders since 2009. The time limit for implementing meter replacement orders is 28 working days after the issue of the works order, and that for testing orders is 21 working days after the receipt of the meter by the WSD laboratory.

Performance of meters

2.17 WSD monitors the performance of meters through a regular meter testing programme. Under this programme about 500 in-service meters are selected randomly each month for testing. According to the Waterworks Regulations, Cap 102A, a meter shall be deemed to register correctly if its inaccuracy does not exceed 3 per cent above or below the correct amount. In 2010/11, 5% of the meters tested under the monitoring programme failed to meet the accuracy rule.

ADJUSTING BILLS FOR DEFECTIVE PERIOD

Basis for adjustment

2.18 After the replacement of a meter found or suspected to be defective, WSD staff will review the consumption pattern of the account and adjust the bills for the defective period where appropriate. Where the basis for calculating the adjustment is concerned, regulation 31 of the Waterworks Regulations, Cap. 102A provides:

> "The consumption for any period during which a meter is known or suspected to be out of order, has been removed or is missing or inaccessible shall be calculated-

(a) according to the average daily rate of consumption obtained between any successive readings before that period; or

(b) at the discretion of the Water Authority (i.e. Director of Water Supplies), according to the average daily rate of consumption between any successive readings following the repairing or replacement of a meter that was out of order; or

(c) where it would be inappropriate to calculate the consumption in the manner specified in paragraph (a) or (b), whether by reason of fluctuations in consumption or otherwise, in such manner as may be agreed between the Water Authority and the consumer."

Timing of adjustment

2.19 As regards the timing of issue of the adjustment bill, CAS Instruction No. 1/2008 (revised on 17 June 2010) provides that:

- If preceding period consumption is to be used for calculation, the revised bill should be issued within six weeks after meter testing is completed or receipt of the monthly report on MR code NR (Zero warning but there should be water consumption) by CAS staff.

- If succeeding period consumption is used for bill adjustment, the revised bill should be issued within six weeks after routine meter reading is available.

Notifying the consumer of adjustment

2.20 As regards the mode of notifying the consumer of the adjustment, CAS Instruction No. 1/2008 (revised on 17 June 2010) provides that:

- If the adjustment involves four or more billing periods, the adjustment should be explained in a letter to the consumer, who should be invited to raise objection with supporting reasons before the issue of the actual adjusted bill.

- If the adjustment involves three billing periods, the adjusted bill should be accompanied by a letter explaining the adjustment.

- If the adjustment involves one or two billing periods and original bills had already been issued for the adjustment period, the adjusted bill should be accompanied by a letter explaining the adjustment.

- If the adjustment involves one or two billing periods and no bill had been issued for the adjustment period, an adjusted bill with suitable messages should be issued.

MAKING CHANGES TO CCBS

2.21 CCBS is an integrated computer system supporting the meter reading, charge calculation, billing, works order management and customer contact management functions described above. It underpins the day-to-day operation of the Meter Reading Section, Districts Sections, Customer Contact Section, Customer Services Section and CAS (**para. 2.3**). The system was commissioned in 2005.

2.22 From time to time WSD makes changes to CCBS to enhance its performance and to rectify system inadequacies. There are four key stages in introducing changes to CCBS as follows:

a. initial assessment by WSD of proposed change;

b. analysis of technical and financial aspects of the proposed change by CCBS Contractor (which may involve feasibility study for complicated changes);

c. evaluation and decision on the proposed change by WSD (which may involve obtaining approval from Government Logistics Department for complicated changes); and

d. implementation of change by CCBS Contractor.

2.23 As at end June 2011, 108 changes to CCBS had been completed and 29 were yet to be completed. On average it took 11 months to implement a change to CCBS. The quickest change took less than one month and the longest took 54 months.

2.24 Much of the work on CCBS changes was held up during mid 2009 to mid 2011 due to a major upgrading exercise of CCBS. During that period only urgent and high priority changes were made. As at end of June 2011, all enhancements and rectifications requested after February 2009 (28 months ago) were still outstanding.

STAFF INSTRUCTIONS

2.25 Details of the MR codes, the consequential follow-up actions, and the billing and adjustment arrangements are set out in WSD Departmental Instruction 2004 (Revised in December 2010). The previous version of this instruction was issued in July 1998. The greater part of the instruction has become obsolete since the commissioning of CCBS in 2005. The department took five years to revamp this instruction.

2.26 WSD explained that during the initial period of CCBS operations the operation was not stable and changes were required. Staff were kept informed through the updating of manuals and handbooks. WSD Departmental Instruction 2004 summarising the changes was re-issued after the system had stabilised and experience consolidated.

3

CASE STUDIES

3.1 Many of the complaints against WSD are about water bills and adjustment of bills. Six illustrative cases are summarised below.

CASE NO. 1

The complaint

3.2 Mr A did not receive any water bills between late 2005 and early 2007. In November 2008, he received a letter from WSD enquiring about the zero consumption recorded in his meter. The period concerned was, however, not specified in the letter.

3.3 After phoning WSD, Mr A received a second letter dated 9 December 2008 from WSD enclosing an estimated bill for $800 for the period from September 2006 to February 2007. The only explanation given was that “his meter was defective”. No explanation was given as to why the meter was considered defective or how the bill amount was calculated.

3.4 It was only at his request that WSD issued him with a third letter on 29 December 2008 which set out the basis for calculating the estimated bill.

3.5 Mr A complained to this Office about the way WSD had handled his case, particularly the long time WSD took to raise the bill adjustment with him, its

failure to include essential information in its letters to him, and failure to produce any proof that his meter was defective.

Brief facts of case

3.6 Our investigations showed the following sequence of events which led to WSD's letter of November 2008 (**para. 3.2**):

a. The complainant's water meter did not record any consumption during three routine readings in 2006. All three MR2s concerned entered the MR code V (Vacant)[3] indicating Mr A's premises to be vacant. No action was triggered by this code.

b. During another routine reading in January 2007, the MR2 found the meter to be defective and entered the MR code NR (Zero warning but there should be water consumption) triggering an order for meter replacement.

c. WSD replaced the meter in February 2007.

d. In November 2008 WSD took action to recover the water charges for the period of defective meter.

Deficiencies observed

3.7 The case revealed WSD to have the following deficiencies:

a. Failure to identify the meter as defective by the three MR2s, suggesting insufficient training/guidance provided to MR2s and insufficient monitoring of their performance by supervisors.

b. Long time taken to observe the water consumption pattern after meter replacement before bill adjustment (21 months after replacement), showing a lack of monitoring of case progress.

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[3] *MR code V (Vacant) was an old code in use at the time of this case. It was replaced by other codes as part of WSD's improvement measures introduced in June 2010. Details of the improvement measures are given in para. 4.11.*

c. Long time taken to raise the bill adjustment with Mr A (adjusting in November 2008 a bill for the period from September 2006 to February 2007) and failure to provide essential information in its letters of November 2008 (length of period under query) and 9 December 2008 (basis for estimated bill), showing a lack of consideration for the consumer.

d. WSD practice of not testing meters coded NR (Zero warning but there should be water consumption) (**para. 2.14(c)**) and not requiring MR2s to record their site observations for this code (**para. 2.8(d)**), making it difficult for WSD to prove the meter to be defective.

CASE NO. 2

The complaint

3.8 The complainant was an Incorporated Owners of a commercial/residential building and the meter concerned was serving the common areas of that building. Between early 2006 and late 2008 the complainant received a total of eight zero bills and did not have to pay any water charges.

3.9 In May 2009, the complainant received a letter from WSD informing that the meter had been found defective and replaced in September 2008; and its bill for the period from July 2005 to September 2008 would be adjusted to $25,000 unless it could explain within 14 days the reason for zero consumption during that period.

3.10 The complainant complained to this Office about the way WSD had handled the case. It was particularly upset about the long time taken by WSD to make the adjustment and the large amount involved.

Brief facts of the case

3.11 Our investigations showed the following sequence of events leading to WSD's letter of May 2009 (**para. 3.9**):

a. Between March 2006 and July 2008 zero consumption was measured at each of eight routine meter readings. Each time, MR code ZX (Zero warning but insufficient information to judge whether or not there was consumption) was inputted. According to the rules of the system at that time, no action was triggered.

b. The case came to the attention of Customer Accounts Section staff after the sixth ZX. In December 2007 the staff issued an order for meter replacement.

c. WSD replaced the meter in September 2008, nine months after the issue of the order, despite the requirement in Departmental Instruction No. 2004 (dated 19 July 1998) for carrying out meter replacement orders in two months. WSD explained that the delay was due to a surge in workload and reprioritisation of work – at that time WSD had about 43,000 works orders which had to be sorted out manually.

d. In May 2009 (i.e. another eight months later), WSD wrote to the complainant about bill adjustment.

Deficiencies observed

3.12 The case revealed WSD to have the following deficiencies:

a. The meter concerned was a common meter serving the whole building. Our site visit showed that it was marked clearly as such and that all the meters in the building were kept under lock such that meter reading would require the caretaker to grant access. By simply asking the caretaker, the MR2s concerned would probably have found out whether there was consumption. Eight consecutive entries of the MR code ZX suggests a lack of due diligence on the part of the MR2s concerned and insufficient monitoring of their performance by supervisors. Photos showing the site conditions are at **Annex 3**.

b. The issue of works order only after the sixth ZX suggests insufficient checks in the WSD system in monitoring such cases at that time. (WSD introduced in 2008 an improvement measure, whereby input of three consecutive ZXs will trigger an order for meter replacement and test.)

c. The long time taken to implement the meter replacement order (nine months) shows insufficient monitoring of works orders and failure to follow instructions.

d. The long observation time taken for bill adjustment (eight months after meter replacement) shows insufficient monitoring of case progress.

e. The long time taken to raise the bill adjustment with the complainant (adjusting in mid 2009 a bill for July 2005 to September 2008) shows a lack of consideration for the consumer.

CASE NO. 3

The complaint

3.13 Prior to 2006, Mr C's usual water bill amounted to about $800 per four-month period. However, during the seven billing periods from March 2006 to August 2008, he received and paid water bills totalling $600.

3.14 In June 2009 he received a letter from WSD informing him that due to low consumption being recorded during a number of routine readings, his meter was considered defective and replaced in August 2008. He was asked to supply reasons, if any, for the low consumption before WSD considered adjusting his bills for the defective period. However, the defective period was not specified in WSD's letter.

3.15 Upon his request, WSD wrote to him again in July 2009, explaining that his meter had been tested to be defective (it was revealed later that the meter had not been tested), the defective period was from March 2006 to August 2008, and that WSD would adjust his bill for the defective period to $5,500 on the basis of his

consumption after meter replacement, unless he could supply information explaining the low consumption. There was no mention of the amount (i.e. $600) already paid by Mr C for the defective period.

3.16 Mr C complained to this Office about the way WSD had handled the bill adjustment. He was particularly aggrieved about the following:

- WSD took such a long time to raise the adjustment with him and the amount involved was so large;

- WSD failed to notify him before replacing his meter (WSD did include in its water bills messages to this effect but these messages were not conspicuous and could easily have been missed);

- WSD could not produce any meter test result and only assumed his meter to be defective on the basis of changes in the consumption measured; and

- WSD appeared to have ignored the water charges already paid by him for the defective period.

3.17 He considered WSD to be at fault and he was being "penalised" for WSD's fault.

Brief facts of case

3.18 Our investigations showed the following sequence of events leading to WSD's letter of June 2009 (**para. 3.14**):

a. Between March 2006 and March 2008, Mr C's meter recorded low consumption at six routine meter readings. However, these readings passed all the system checks, including the PDA Zero Warning and the CCBS High/Low Check, and no rectification action was triggered.

b. At the next reading in July 2008, the meter was observed to be not moving and MR code NR (Zero warning but there should be

water consumption) was inputted. This triggered an order for meter replacement.

c. WSD replaced the meter in August 2008.

d. In June 2009, WSD wrote to Mr C about adjusting his bill.

Deficiencies observed

3.19 This case revealed WSD to have the following deficiencies:

a. Long time taken to identify the meter as defective (two years) suggesting inadequacy of the system checks.

b. Long time taken to observe the meter before bill adjustment (ten months after meter replacement) showing a lack of monitoring of case progress.

c. Long time taken to raise the bill adjustment with Mr C (adjusting in mid 2009 a bill for the paid from March 2006 to August 2008) showing a lack of consideration for the consumer.

d. Incomplete information in WSD's letter of June 2009 (failure to specify defective period) and incorrect information in its letter of July 2009 (about meter having been tested), showing carelessness in communicating with consumers.

e. WSD practice of not testing meters coded NR (Zero warning but there should be water consumption) and not requiring MR2s to record their site observations for this code, making it difficult for WSD to prove the meter to be defective.

f. Use of inconspicuous bill messages to notify consumers of meter replacement.

CASE NO. 4

The complaint

3.20 Mr E moved into his flat and took up the water account in July 2008. He did not receive any water bill up to April 2010.

3.21 In May 2010 he received a letter from WSD informing him that his meter, which recorded zero consumption for the period from August 2008 to March 2010, had been replaced and tested to be defective. He was invited to supply reason(s) for the low consumption before WSD gave consideration to adjusting his bills for the defective period.

3.22 After supplying explanations to WSD, he was informed by WSD in September 2010 that his bill for the defective period was estimated to be $1,700.

3.23 Mr E complained to this Office about the way WSD had handled the case, particularly the long time taken and the large bill involved.

Brief facts of case

3.24 Our investigations showed the following sequence of events leading to WSD's letter of May 2010 (**para. 3.21**):

a. Between December 2008 and December 2009, Mr E's meter was recorded as ZX (Zero warning but insufficient information to judge whether or not there was consumption) four times. Under the built-in logic of CCBS, an order for meter replacement and test should have been triggered if ZX was inputted three times consecutively (**para. 2.7 table**). However, because WSD conducted a spot check after the first ZX reading in December 2008 and inputted special code SC (Spot check), the series of ZX inputs in this case was interrupted. As a result, the order which should have been triggered in August 2009 was only triggered four months later in December 2009.

In response to our inquiry in April 2011, WSD said that although aware of this design inadequacy in its system, it considered the risk of recurrence to be small and had no plans to take any remedial action.

Upon further inquiry, WSD indicated that it had issued a new staff instruction in July 2011 requiring spot-checkers to input the code ZX in addition to the spot check code SC to avoid interruption to the series of ZX codes.

b. The meter was replaced three months later in early March 2010 and tested one and a half months later in late April 2010.

Deficiencies observed

3.25 We observed WSD to have the following deficiencies:

a. Taking a long time to rectify system inadequacies. The system design inadequacy had been revealed in 2010, but up to April 2011 WSD had no plan to address it, and only took rectification action in July 2011 after our repeated inquiries

b. Long time taken to implement the order for meter replacement (three months) and test (one and a half months), showing insufficient monitoring of works orders.

CASE NO. 5

The complaint

3.26 Before 2007, Mr F's usual water bill amounted to about $2,400 per four-month period. Between December 2006 and July 2008 (five billing periods), he received and paid water bills totaling about $6,000. In April 2009, he received a letter from WSD informing him that his meter had been found defective between January 2007 and July 2008 and his bill for the defective period would be adjusted to $12,000. He was asked to advise WSD if there were significant changes in his consumption pattern that would affect the adjustment.

3.27 In the ensuing months Mr F communicated with WSD several times on the issue. Not satisfied with WSD's explanation for the adjustment, he complained to this Office about the way WSD had handled his case, including the long time taken to notify him of the adjustment and the large amount involved. He had paid all water bills issued during the defective period and had received no forewarning that the bills might be adjusted. (WSD did include in its bills messages to this effect but these messages were not conspicuous and could easily have been missed.) He considered WSD to be at fault, but he was "penalised" instead.

Brief facts of case

3.28 Our investigations showed the following sequence of events leading to WSD's letter of April 2009 (**para. 3.31**):

a. Mr F's meter was first observed as defective at a routine meter reading in early December 2007. MR code NR (Zero warning but there should be water consumption) was entered. Under CCBS, this triggered a meter replacement order.

b. In mid December 2007 WSD Field Activity staff tried to replace the meter but found that it was obstructed on site.

c. Again, at the next routine reading in April 2008, the meter was observed as defective and MR code NR was inputted. Under the built-in logic of CCBS, the recording of a second NR triggered an inspection order. The assumption behind was that the meter should have been replaced in the four months' time before the second routine reading; and if a second NR code was entered, it might suggest the zero consumption was due to some other reason than the meter being defective; hence, the supply system should be inspected to find out the problem.

d. In late April 2008 WSD Field Activity staff wanted to follow up on the replacement order, but, noting that an inspection order had been issued in the meantime, put the replacement on hold without looking further into the matter.

e. In mid July 2008 an inspection by WSD Inspection staff confirmed the supply system to be in order and the meter defective. WSD Field Activity staff was requested to replace the meter. This was done in late July 2008, seven months after the issue of the replacement order.

f. WSD staff observed the consumption pattern for another nine months before notifying Mr F in April 2009 of the bill adjustment.

Deficiencies observed

3.29 We observed WSD to have the following deficiencies:

a. Unsatisfactory interface between CCBS and its users. The second NR command would only work if the meter had been replaced after the first NR. In this case the culmination of the following three factors had rendered the mechanism dysfunctional:

- CCBS had not been properly programmed to verify the assumption that the meter had been replaced before issue of the inspection order;
- There was a delay in meter replacement; and
- The WSD Field Activity staff concerned simply took the CCBS-generated orders at face value and failed to look into the facts of the case when holding up the replacement order.

b. The delays in both this case and Case no. 4 are related to problems in using consecutive input of the same code to trigger action on CCBS. In this case the second consecutive code triggered an inappropriate command because the assumption behind had not been verified. In Case no. 4 the series of consecutive codes was interrupted by input of other codes. The consecutive code mechanism is widely used in the WSD

system. Inadequacies revealed in these cases suggest that there should be a comprehensive review of the rules and assumptions in using consecutive codes.

c. Long time taken to replace the meter (seven months) and to inspect it (three months), showing insufficient monitoring of works orders.

d. Long time taken (nine months) to observe the consumption pattern before bill adjustment, showing a lack of monitoring of case progress.

e. Long time taken by WSD to raise bill adjustment with Mr F (adjusting in April 2009 a bill for the period from December 2006 to July 2008), showing a lack of consideration for the consumer.

f. Use of inconspicuous bill messages to notify consumer.

CASE NO. 6

3.30 Mr G moved into his flat and took up the water account in August 2009.

3.31 In December 2009 and April 2010 WSD visited his flat two times to take routine readings, but found access to be locked. Under the built-in logic for estimating bills for inaccessible meters, CCBS estimated Mr G's bill to be zero for each of the two billing periods. No bill was issued to him.

3.32 In August 2010 WSD managed to take a routine reading which showed that 136 cu.m. had been consumed. This was automatically assumed by CCBS to be consumed during the last four-month period, and a bill of $1,100 was issued to Mr G.

3.33 Concerned about the large amount of his bill, Mr G made enquiries with WSD. After learning about the above facts, he explained to WSD that the amount of 136 cu.m. was in fact his total consumption for the period from August 2009 to August 2010. According to the tiered structure of the water tariff, 136 cu.m.

of water should attract a charge of $600 if consumed over twelve months, and $1,100 if consumed over four months.

3.34 WSD accepted Mr G’s explanation and adjusted his bill to $600.

3.35 In response to our inquiries, WSD said that the built-in logic for estimating bills for newly taken up accounts was flawed. A rectification order had been issued in late 2009. Up to August 2011 (more than 1.5 years later) this order has not been implemented yet.

4

OUR OBSERVATIONS

4.1 WSD's regular monitoring programme showed that in 2010/11, 5% of in-service meters failed to meet its accuracy rule when tested (**para. 2.17**). By projection, out of the 2.8 million in-service meters in the territory, 138,000 may be inaccurate or defective. This is a cause for concern. Any deficiency in dealing with defective meters and related bill adjustments warrants serious attention.

4.2 In the cases studied, WSD had reasons to initiate bill adjustment. WSD is authorised under regulation 31 of the Waterworks Regulations, Cap. 102A to issue or adjust water bills on the basis of estimates when "the consumption for any period during which a meter is known **or suspected** to be out of order". In practice, WSD will observe the consumption pattern after meter replacement and establish the need for adjustment before initiating action, and the consumer will be given an opportunity to explain the consumption pattern if he considers adjustment not warranted.

4.3 However, the manner in which such actions were carried out, particularly the long time taken over the cases and the lack of consideration for the consumer, was a source of much aggravation and frustration among the complainants, and there is much room for improvement.

4.4 WSD makes use of a highly automated system to support its meter reading and billing process. Most cases are handled automatically by CCBS and are brought to staff attention only at a late stage (**paras. 2.6** and **2.11**) We do not question that a highly automated system is necessary for handling the huge number of

accounts WSD has to serve. However, the proper functioning of such a system relies heavily on the proper operation of all the inter-dependent links in the chain of activities, including correct and timely input, faultless system design, sufficient system checks, seamless interface between CCBS and WSD staff, and efficiency in rectifying system inadequacies once revealed. Weakness or deficiency in any one link can trigger, through the system, outcomes that could lead to highly undesirable and at times absurd consequences.

4.5 We have identified the following deficiencies in the way WSD handles defective meters and related bill adjustments:

a. insufficient staff training and monitoring in meter reading;
b. insufficient system checks for identifying defective meters;
c. system inadequacies;
d. insufficient monitoring of works orders;
e. insufficient progress monitoring in adjusting bills;
f. confusion and other problems relating to meter testing;
g. inadequate staff instructions; and
h. lack of consideration for consumers

(a) INSUFFICIENT STAFF TRAINING AND MONITORING IN METER READING

Problem of training/monitoring

4.6 The long time taken in identifying defective meters is a major source of problems in adjusting bills. Under the WSD system, there are two main sources for identifying defective meters: from observations made by MR2s during meter reading and from the system checks such as the CCBS High/Low Check.

4.7 **Cases no. 1** (**para. 3.7(a)**) and **2** (**para. 3.12(a)**) illustrate MR2s' failure in identifying defective meters as such. Our analysis has shown that the training/guidance given to MRs in this aspect as limited (**para. 2.8**) and monitoring by supervisors insufficient (**para. 2.9 (b)** and **(c)**). We doubt the WSD policy of not requiring MRs to know the implications of the MR codes (**para. 2.8(c)**). In a system where an MR code will trigger a whole chain of outcomes, such compartmentalised mentality in training and guiding MRs can only lead to trouble.

Related problem of “unspecified” MR codes

4.8 As a related issue, there is room for improvement in the use of MR codes. A closer examination of the 61 MR codes shows that they are of two types:

a. Self-explanatory type: The code contains letters denoting the explanation for the irregularity. The majority of the MR codes are of this type. The risk of these MR codes being entered inappropriately is relatively low. Examples are:

    a. VA (Vacant with sale advertisement)
    b. ZG (Godown of no consumption)
    c. L (Access locked)

b. “Unspecified” type: The code gives no explanation about the observation made by the MR2, unless he puts down remarks for that purpose. While there may be a need to use “unspecified” codes in order to allow for some flexibility, the risk of this “unspecified” type of MR codes being entered incorrectly is higher. Examples are:

    a. V (Vacant)
    b. VX (Vacant – other reasons)
    c. ZN (No consumption as judged by Meter Reader)

4.9 **Case no.1** is a good illustration of the “unspecified” code V (Vacant) being entered inappropriately. The risk associated with “unspecified” codes could be reduced by adding safeguards, such as requiring MR2s to put down remarks when using this type of codes, or requiring Senior MRs to take appropriate follow-up action on all cases with such codes. Unfortunately, there is no such safeguard.

Improvements in June 2010

4.10 In response to our recommendations made in relation to some of the complaints, WSD introduced in June 2010 new arrangements to help MRs distinguish between “defective” and “genuine” zero consumption cases. The new arrangements were promulgated by Customer Accounts Section Instruction No. 1/2008 (revised

June 2010). MRs were given verbal briefings by their supervisors and issued with a revised version of the two-page MRRCI Instructions (i.e. **Annex 1**).

4.11 The new arrangements are set out in the table below.

Before 17 June 2010	**After 17 June 2010**	**Our observations**
V (Vacant)	Replaced by six codes: ● VA (Vacant with sale advertisement) ● VN (Unoccupied new building) ● VR (Vacant pending redevelopment) ● VV (Vacant village house) ● VT (Tenant said vacant) ● VX (Vacant – other reasons)	The new code VX is still an "unspecified" code.
ZN (No consumption as judged by MR)	According to CAS Instruction No. 1/2008 (revised 17 June 2010), "MRs will no longer use this code".	In practice this "unspecified" code is still in use by some MRs and is retained in MRRCI Instructions (revised June 2010).

4.12 We interviewed some Senior MRs and MR2s individually in December 2010 with a view to finding out more about their procedures and practices, particularly in respect of the arrangements introduced in June 2010. From these interviews we have the following observations:

a. For "unspecified" code ZN (No consumption as judged by MR) – Not only are the two staff instructions inconsistent (**para. 4.11 table**), but also the practices among different MRs. Some MR2s said their Senior MR had told them not to use this code, other MR2s said that they were told to put down remarks explaining their judgment when using this code, while still others said that they would use this code without putting down any remark.

b. For "unspecified" code VX (Vacant – other reasons), most MR2s said they would use this code without putting down remarks to explain the "reasons".

c. In many cases, MR2s have several different interpretation or understanding of an MR code. Most MR2s also said that the 61 MR codes were too many, and that they would normally use not more than 20 of these codes.

Our comments

4.13 It can be seen that although the improvements introduced in June 2010 are useful, they have not addressed the problem of the "unspecified" codes being used inappropriately and without safeguards. Furthermore, the inconsistencies between the two staff instructions and among different staff in respect of the use of MR codes reflect on the poor internal communication of WSD.

4.14 The above (**paras. 4.6 – 4.13**) points to the need for further enhancement in staff training and monitoring for WSD. WSD should impress on the MRs their importance in the meter reading and billing process. Up to now MRs have devoted considerable efforts to ensure the accuracy of meter readings and such efforts have paid off (accuracy of meter reading was 99.95% in 2010/11). Yet, their performance in dealing with irregularities is relatively weak, particularly in the identification of defective meters and the use of the "unspecified" MR codes. WSD needs to pay greater attention to these areas in future training and monitoring. The WSD policy of not requiring MRs to know the implications of the MR codes on follow-up actions should be reviewed (para. **2.8(c)**). With 61 MR codes being used at present, it is difficult for MRs to learn and remember the different implications of the codes. It is advisable for WSD to review the MR codes with a view to simplifying them.

(b) INSUFFICIENT SYSTEM CHECKS FOR IDENTIFYING DEFECTIVE METERS

The problem

4.15 As mentioned in **para. 4.6**, another main source for identifying defective meters are the built-in checks in the system. These built-in system checks include the PDA Zero, Negative and High/Low Warnings (**para. 2.9(a)**) and the CCBS High/Low Check (**para. 2.10**).

4.16 **Case no. 3** illustrates how low consumption can be recorded six times without triggering any PDA Zero Warning or action under the CCBS High/Low Check. Since then WSD has tightened the rules of the latter check.

Our comments

4.17 We suggest that the rules of the system checks should be kept under review and tightened where appropriate.

4.18 Furthermore, as long periods of zero and/or low consumption are a useful warning sign for identifying defective meters, we consider that WSD should enhance its checks in this respect. Possible measures to be considered include having repeat zero consumption readings double-checked by conducting a special reading and mounting special programmes to check all accounts with long period, say, 12 months, of zero consumption.

(c) SYSTEM INADEQUACIES

The problem

4.19 The efficient running of WSD's highly automated system is heavily dependent on the proper operation of each link in the chain of activities.

4.20 However, as shown in **Cases no. 4** (**para. 3.24 (a)** and **3.25(a)**), **5** (**para. 3.29(a)** and **(b)**) and **6** (**para. 3.35**), the system still contains inadequacies after years of operation, making changes to CCBS is slow, and staff/computer interface unsatisfactory.

4.21 Furthermore, WSD statistics show the time taken to make changes to CCBS or to fix the system is unacceptably long (average time taken 11 months and all rectifications requested after February 2009 have yet to be implemented) (**paras. 2.23** and **2.24**).

Our comments

4.22 We consider that:

a. WSD should review the rules and assumptions for using consecutive inputs of the same MR code to trigger action, a practice which is widely used in its system. The problems in both Cases no. 4 and 5 are related to system inadequacies in this area.

b. WSD staff should be more sensitive when executing conflicting orders generated by CCBS by, say, taking a further step to check the account history.

c. WSD should speed up the process in rectifying system inadequacies.

(d) INSUFFICIENT MONITORING OF WORKS ORDERS

The problem

4.23 The long time taken to implement works orders in **Cases no. 2** (**para. 3.12(c)**), **4** (**para. 3.25(b)**) and **5** (**para. 3.29(c)**) suggests that there is inadequate progress monitoring in this regard.

4.24 WSD revealed that at the time of **Cases no. 2** and **5**, i.e. in 2007 and 2008, there were no progress monitoring reports and outstanding works orders had to be sorted out manually (**para.3.11(c)**).

4.25 Since 2009 WSD has introduced regular progress monitoring reports. However, **Case no. 4** (which took place in 2009 and 2010) shows that there were still delays in implementing works orders. A close examination of WSD monitoring reports shows that they only set out the creation dates of the works orders but not the target completion dates. As different types of orders have different time limits, these reports are not in a suitable format to facilitate efficient and effective monitoring.

Our comments

4.26 The above shows that WSD has made gradual improvements in progress monitoring but needs to improve further. For example, the progress monitoring reports should set out the target completion dates of individual works orders.

(e) INSUFFICIENT PROGRESS MONITORING IN ADJUSTING BILLS

The problem

4.27 One of the frequent complaints related to bill adjustments is the long time taken by WSD to observe the consumption pattern after meter replacement before they notify consumers about the bill adjustments. This problem is illustrated in **Cases no. 1** (**para. 3.7(b)**), **2** (**para. 3.12(d)**) and **3** (**para. 3.19(b)**).

Improvements

4.28 Before early 2010, despite the many complaints and our suggestions to set a time limit on the observation time after meter replacement, WSD had been reluctant to do so. When pressed, it only gave an estimate of four to eight months.

4.29 Having reconsidered the matter, WSD issued an internal instruction in March 2010 (CAS Instruction No. 1/2008 (revised March 2010)) stipulating that the revised bill should be issued within **one month** after meter testing or routine meter reading is available.

4.30 Three months later, WSD reconsidered the matter again and issued yet another revised instruction in June 2010 (CAS Instruction No.1/2008 (revised June 2010)), further revising the time limit from one month to **six weeks**.

Our comments

4.31 WSD should be given credit for taking steps to improve in this area. We urge WSD to further reduce the time limit as far as practicable.

(f) CONFUSION AND OTHER PROBLEMS ABOUT METER TESTING

Confusion about meter testing

4.32 WSD's general rule on testing of replaced meters is set out in **para. 2.14**. There is considerable evidence of much confusion and even ignorance among WSD staff about this rule, as reflected in the inaccurate information and inappropriate advice provided in its internal instructions (**para. 2.15**) and the incorrect information supplied to consumers (**Case no. 3**).

Inadequacy of the meter testing rule

4.33 Apart from the issue of confusion/ignorance among WSD staff, a closer look at the WSD meter testing rule raises the question of whether the rule is adequate to support the subsequent bill adjustment, especially when MR code NR (Zero warning but there should be water consumption) is used. As mentioned in **para. 2.14(c)**, meters replaced in connection with MR code NR are not tested. Also, when inputting this code, MR2s are not required to put down remarks or record the reasons for judging that there is water consumption (**para. 2.8(d)**). As a result, WSD is unable to adduce concrete evidence to prove that the meter was indeed defective. WSD only relies on unusual fluctuations in consumption measured to explain to the consumer why it considers the meter to be defective, when taking action to adjust bills in such cases. This is inadequate in answering consumers' queries raised in **Cases no. 1** (**para. 3.5**) and **3** (**para. 3.16**) and would give consumers the impression that WSD is arbitrary and high-handed.

Our comments

4.34 We consider that:

a. WSD should review its meter testing rule, particularly for MR code NR (Zero warning but there should be water consumption). Where site observations clearly support presence of water consumption and such observations are properly recorded by the MR2s, lab-testing of meters may be obviated.

b. WSD should enhance staff training to clarify its meter testing rule.

(g) INADEQUATE STAFF INSTRUCTIONS

The problem

4.35 Our analysis of WSD procedures and practice and complaint cases shows that the administration within the Department is fairly muddled. This is partly due to the inadequacy of its staff instructions and training.

a. Taking more than five years to revamp WSD Departmental Instruction no. 2004 is one example of WSD not providing its staff with adequate guidelines when needed. Although WSD has provided some valid explanations (**para. 2.26**), taking five years to revamp an instruction is still unacceptably long. From our interviews with MRs, we observed that there is much reliance on experience and word of mouth to pass on knowledge, leading to inconsistency and inaccuracy.

b. Some of WSD's staff instructions contain inaccurate information and inappropriate advice, such as those on meter testing contained in Departmental Instruction No, 2004 and CAS Instruction No. 1/2008 (**para. 2.15**).

c. Some WSD staff instructions are further amended within a short time, suggesting that the amendments have been introduced in haste. One example is the changes to the time limit for adjusting bills in the March 2010 and June 2010 versions of CAS Instruction No. 1/2008 (**para. 4.30**).

d. Different staff have different interpretations of staff instructions, such as the use of the MR codes (**para. 4.12**).

Our comments

4.36 With such inadequate instructions, it is difficult for WSD frontline staff to provide complete and accurate responses to customer enquiries, and in some cases, not even a reasonable service to customers. We consider that WSD should review its staff instructions with a view to providing a set of clear and comprehensive guidelines, and align the understanding of its staff with their correct interpretation through

training. The heavy reliance on verbal instructions has given rise to problems. There is a clear need for WSD to enhance its written instructions.

(h) LACK OF CONSIDERATION FOR CONSUMERS

4.37 From a consumer's point of view, any under-collection of water charges during the defective period is entirely WSD's responsibility, as the water meter is supplied by WSD and meters are read by WSD staff. It is understandable for consumers to feel aggrieved when billed with hefty charges long after the event, with little proof or explanation as to how and when the meters were found defective, and often with scant information as to how the adjustments were arrived at.

4.38 One of the stated missions of WSD is "To adopt a customer-oriented approach in services". WSD has not lived up to this mission in the way it handles bill adjustments. Examples of lack of consideration for consumers abound in the cases studied:

- WSD took an unduly long time before notifying the consumer of the bill adjustment (in **Cases no. 1, 2, 3,** and **5**).

- WSD omitted important information from its letters. In **Cases no. 1** and **3**, WSD asked the consumers to explain their exceptionally low consumption without telling them the period involved. In **Case no. 1**, WSD failed to provide an adequate explanation for the adjustment in its initial letters.

- WSD supplied incorrect information in its letters, such as telling consumers their meters had been tested and found defective when in fact no test had been carried out (**Case no. 3**).

- In case after case (such as **Cases no. 3** and **5**) WSD relied on inconspicuous messages in its bills to communicate important information to consumers, including notifying them of meter replacement and alerting them of future bill adjustment.

Improvements

4.39 In recent years, WSD has made a number of efforts in improving its handling of bill adjustments. These efforts include setting a time limit for the observation period after meter replacement (**paras. 4.29** and **4.30**) and issuing instructions on when and how to communicate with consumers in adjusting bills (**paras. 2.19** and **2.20**).

Our comments

4.40 All the improvements made are useful and will go some way in streamlining the bill adjustment process. However, as discussed above, further improvements are needed in a number of areas, including the detection of defective meters (**paras. 4.13** and **4.17**) and progress monitoring (**para. 4.26**). Where communicating with consumers is concerned, WSD staff should bear in mind that when faced with bill adjustments, consumers are invariably upset and ought to be handled with care and consideration. WSD staff should try to think from the consumer's angle and adopt a more customer-oriented approach when handling bill adjustments and communicating with water account holders.

4.41 Specifically, we have three suggestions.

4.42 First, the latest CAS Instruction No. 1/2008 provides that explanatory letters should be issued when adjusting most bills; however, when adjusting bills covering only one or two billing periods (i.e. up to eight months) for which no original bills have been issued, the adjusted bills will only carry explanatory messages on them. We consider that in the interest of providing a customer-oriented service, WSD should consider issuing explanatory letters for all bill adjustments.

4.43 Second, important messages such as those relating to meter replacement and bill adjustment, at present buried in the water bills, should be presented more clearly[4].

4.44 Third, the water bill should contain clearer information on the tariff and charges applicable to the account, including that for water, sewage, flushing supplies, and trade effluent surcharge; or, at the very least, where to access such

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[4] *As of July 2011 WSD is considering the options of printing such bill messages either in red colour or in bold print. The improvement is expected to be implemented within 2011.*

information. Our detailed comments on presentation of the water and sewage tariff in the current bill are given below.

(a) Water tariff table: Not only is this absent from the bill, but there is also no indication whatsoever in the bill as to where it can be found. When we manage to locate the water tariff table on the WSD website, we find that it is presented in terms of four months or 121.64 days (below). Since no water bill covers exactly 121.64 days, the consumer will have to go through quite a complicated process before calculating how much his water charge should be. To provide a customer-oriented service, WSD should consider including the water tariff table in the bill and revising its format to a per day basis.

Volume of water consumed in 121.64 days	**$ per cu.m**
First tier: first 12 cu.m.	Free
Second tier: next 31 cu.m.	4.16
Third tier: next 19 cu.m.	6.45
Fourth tier: for the remainder	9.05

(b) Sewage tariff table: The way the sewage tariff table is presented in the bill is even more difficult to understand. The front page sets out the sewage charge rate as “$1.43/cu.m.” However, if one tries to calculate one’s sewage charge using this rate one will never be able to arrive at the correct charge. This is because there is a second part to the sewage tariff, and this is buried in the notes on the back page of the bill, which reads: “sewage charge for the first 12 cu.m. in a 4-month period is exempted”.

5

RECOMMENDATIONS

5.1 WSD has the power and duty to recover under-collected water charges from consumers for defective meter periods. Our investigations have shown that in most, if not all, cases studied, WSD is not unreasonable in initiating the bill adjustments, but there is considerable room for improvement in the way that defective meters are identified, bill adjustments handled and consumers informed of these.

5.2 In recent years, WSD has introduced a number of improvements in its staff instructions and work procedures to streamline the meter reading and billing process. These are welcome. However, there are still inadequacies and further room for improvement to achieve its mission to provide a customer-oriented service.

5.3 In this connection, The Ombudsman makes the following recommendations to the Director of Water Supplies:

Meter reading

(1) To review the departmental policy of not requiring MRs to know the implications of the MR codes they key in (**para. 4.14**);

(2) To review the 61 MR codes with a view to simplifying them (**para. 4.14**);

System checks

(3) To keep under review the rules of the system checks for identifying defective meters, and to tighten them as appropriate (**paras. 4.17**);

(4) To consider additional measures for identifying defective meters at an early stage (**para. 4.18**);

(5) To review the rules and assumptions for using consecutive MR codes to trigger follow-up action (**para. 4.22(a)**);

Use of computer system

(6) To speed up the process in rectifying system inadequacies (**para. 4.22(c)**);

Monitoring of works orders

(7) To improve in the area of progress monitoring of works orders, e.g. by setting out the target completion dates of individual works orders in monitoring reports (**para. 4.26**);

Meter testing

(8) To review the meter testing rule, particularly for MR code NR (Zero warning but there should be water consumption), in order to collect sufficient evidence of defective meters to support bill adjustment (**paras. 4.34 (a)**);

Communicating with consumers

(9) To consider issuing explanatory letters to consumers for all bill adjustment cases (**para. 4.42**);

(10) To review the design and layout of the water bill, paying special attention to the presentation of important messages to consumers (**paras. 4.43** and **4.44**);

Staff instructions

(11) To review staff instructions with a view to providing a set of clear and comprehensive guidelines (**para. 4.36**); and

Staff training and monitoring

(12) To enhance staff training and monitoring in a number of areas, including:

a. meter reading, especially on the identification of defective meters (**para. 4.14**);

b. interfacing with CCBS, especially in executing conflicting orders generated by the computer (**para. 4.22(b)**);

c. adopting a customer-oriented approach in communicating with consumers (**para 4.40**); and

d. correct interpretation of staff instructions (**paras. 4.34(b)** and **4.35(d)**)

5.4 WSD has accepted the recommendations of this report and envisages that all improvements can be implemented within a year.

5.5 The Ombudsman is grateful to the Director of Water Supplies and his staff for cooperation throughout this investigation.

Office of The Ombudsman
Ref.: OMB/DI/218
September 2011

ANNEXES

輸入抄錶員備註代碼須知

（例行抄錶適用）

Meter Reader Remark Code Inputting Instructions

(for routine meter reading)

1. 如 PDA 出現 0 讀數警號（Zero Warning），必須再三清楚核實。如讀數正確，應觀察周圍環境、搜集資料以輸入適當的代碼（如 NR, ZX 等）。若現場環境資料不足，必須輸入 ZX。所有 0 讀數必須配合輸入適當的代碼方爲完成記錄。
2. 輸入代碼應力求精準、齊全，絕不可省去不入。尤其 0 讀數的成因可有多種，必須按現場情況輸入代碼。如前所述，若無其他更適合的代碼，0 讀數的代碼應爲 ZX。
3. 如 PDA 出現過高或過低讀數警號（High-Low Warning），必須再三清楚核實。
4. 如 PDA 出現負讀數警號（Negative Warning），必須再三清楚核實。如讀數無誤及水錶安裝正確，應輸入代碼 XX。
5. 輸入由他人提供資料的代碼（如 ZW, ZT 等）時，如情況許可應同時簡單記錄資料來源，如管理員姓氏，鄰居所住單位等。
6. 如未能成功抄錶，必須輸入代碼說明原因，並盡可能向客戶發出 WWO 167B/C/D 表格。

代碼 MR Code	說明 Description		現場處理 Action on Site
ZP	危險/困難錶位	Meter in dangerous/ difficult position.	在記事紙報告情況，繪畫商圖。
L	通道上鎖	Access locked.	嘗試要求客戶、管理員或在場適合人士協助抄錶，或在可行情況下安排於同日另約時間再行抄錶。用備註欄 / 記事紙報告情況，及記錄有助日後抄錶的資料，如客戶聯絡電話、最適合抄錶的時間等。有需要時聯絡高級抄錶員尋求指示。 在可行情況下，即時派發"無法抄錶通知書"(WWO167 表格)，並使用標準格式，記錄有關事項。 示例:L－123456(123456 爲 WWO167 編號，參閱《抄錶組外勤操作備忘》)
ZL	門鎖損壞	Access blocked by defective lock. (can be repaired in a few days)	
O	錶位受阻	Access obstructed.	
OP	喉管阻讀	Meter obstructed by pipe.	
LS	山泥阻路	Landslide near the meter position.	
MC	錶被泥掩	Meter covered by earth.	
F	錶位水浸	Meter location flooded.	
ZF	路面水浸	Road / path to meter flooded.	
PF	錶井水浸	Pit containing meter flooded.	
PJ	錶井蓋難開	Pit cover cannot be opened.	
ZE	升降機壞	Elevators out of order.	
ZD	無人綁狗	Meter guarded by dogs.	
VA	空置待租賣	Vacant with sale advertisement	需要時在備註欄 / 記事紙報告情況。
VN	空置新樓	Unoccupied new building	
VR	空置待重建	Vacant pending for redevelopment	
VT	住客稱空置	Tenant said vacant	
VV	空置村屋	Vacant village house	
VX	空置 (其他原因)	Vacant (other reasons)	
DH	屋已拆毀	Premises demolished.	嘗試抄錶。需要時在備註欄 / 記事紙報告情況。
ZB	屋已燒毀	Premises burnt.	
SD	屋將清拆	Premises to be demolished and meter cannot be reached.	在 PDA 的 eForm 記錄有關資料，例如清拆通告上負責機構的聯絡電話等。
ZT	住客稱不用	Tenant said no consumption.	在備註欄 / 記事紙記錄有關資料來源及其他事項。
ZW	看更稱公共地方不用水	Watchman said no consumption for maintenance of public/ common area	
ZG	貨倉不用	Godown of no consumption.	

代碼 MR Code	說明 Description		現場處理 Action on Site
ZN	不用水 (現場有明確原因)	No consumption (with definite reasons)	在備註欄記錄有關情況。(e.g. stop cock before meter closed / 錶前掣已關)
NR	錶不轉動 (估計有用水)	The reading triggers 0 warning in PDA but there should be water consumption.	如經現場測試，確認水錶不轉動，用備註欄記錄有關事項 (e.g. test NR)
NT	住客稱錶不動	Tenant said meter not moving	嘗試進行簡單的水錶測試
ZX	錶不轉動 (沒有資料估計有否用水)	The reading triggers 0 warning in PDA. Insufficient information to judge no consumption or not.	
RB	讀數倒行	Reading running backwards.	使用本代碼前，先表面觀察水錶是否安裝正確。
XX	負讀數	Negative Reading.	
SE	客戶報錶	Self-read.	如讀數是抄錶時現場獲得，在備註欄 / 記事紙記錄資料來源。
YY	錶號不符	Meter number different from record.	在備註欄 / 記事紙記錄有關資料。
ZU	找不著錶	Meter cannot be located.	
ZO	超出範圍	Meter location out of the assigned route.	
FW	錶面向牆	Meter facing wall.	嘗試用鏡輔助抄錶。
JL	接口漏水	Leakage found at meter joints.	在備註欄記錄漏水位置（在水錶前還是在水錶後，或用記事紙繪畫簡圖記錄漏水位置。如水管爆裂或嚴重漏水，嘗試通知客戶。必要時聯絡高級抄錶員。
ML	錶身漏水	Water leaks from the meter.	
SL	喉管漏水	Water leaks from piping near meter.	
CL	錶前掣漏水	Water leaking from stop-cock.	
SB	封條破損	Seal broken.	
GB	玻璃破損	Meter glass broken / blocking the dials or pointers.	
GO	玻璃模糊	Water vapour masked the meter glass or lens defaced.	嘗試令水氣消散，但小心勿弄破玻璃。
MI	錶號模糊	Unclear meter number.	使用標準格式，記錄有關事項。 示例：HI – 456789aaaaa0（參閱《抄錶組外勤操作備忘》） 或用記事紙繪畫簡圖記錄有問題部份
HI	指針不正	Dials / pointers not in correct positions.	
HM	指針缺失	Dials / pointers missing.	
ID	錶盤骯髒	Dirt covering the dials / pointers.	
LM	錶蓋遺失	Meter lid missing.	只適用於有錶蓋及錶蓋上有水錶號碼的水錶型號，其他水錶型號不必輸入此代碼。
MD	水錶損毀	Meter damaged.	如損壞情況可用其他代碼更清楚記錄，不應使用此代碼。
MR	錶被拆走	Meter removed from the pipe.	在備註欄 / 記事紙報告情況。
MP	資料不確	Wrong meter particulars including meter type and size.	用 PDA 的 eForm 記錄有關資料。
MQ	數位錯誤	Wrong meter dials.	
WA	水錶錯置	Wrong meter arrangement.	使用本代碼前，嘗試測試用水，並在備註欄 / 記事紙報告情況。
WF	水錶倒裝	Meter fixed in the reverse direction.	
SP	內喉已封	Water supply plugged but meter still remains.	
WM	無錶用水	Supplies given without meter.	用記事紙報告情況，並繪畫簡圖。
ZC	不用水 相連單位	No consumption record in common flats.	在備註欄 / 記事紙記錄有關資料。
NS	用水用途 改變	Change in nature of water use.	
ZS	無來水	Meter installed with no water supplies.	在備註欄 / 記事紙記錄有關資料。
ZI	錶位受阻 (其他原因)	Meter inaccessible due to special reasons.	使用本代碼時須向高級抄錶員徵詢意見。在備註欄 / 記事紙記錄報告情況。
SR	特別原因 （內部用途）	Special reasons – internal official use.	

Annex 2
(para. 2.9(b))

Routine Read Completed From: 29/12/2010
To: 29/12/2010

Routine Performance Report

	Name	Staff	Number of route read	Read SP	Unread SP	L	O	F	GO	HI	ID	NR	ZX	Z	Misread (Spot Check)	Accuracy	Upd Loc	New Meter
1		4678	1.00	35	0	0	0	0	0	0	0	0	0	0	0(0)	0	0	0
2		4867	0.74	281	0	0	0	0	0	0	0	0	0	0	0(0)	0	0	0
3		7073	0.99	30	0	0	0	0	0	0	0	1	0	0	0(0)	0	0	0
4		7549	0.48	224	0	0	0	0	0	0	0	2	8	0	0(0)	0	0	0
5		7550	1.00	587	0	0	0	0	0	0	0	0	1	0	0(0)	0	1	0
6		7551	1.00	522	0	0	0	0	0	0	0	0	1	0	0(0)	0	0	1
7		7552	0.85	225	0	0	0	0	0	0	0	2	10	0	0(0)	0	0	0
8		7556	1.00	415	0	1	0	0	0	0	0	0	5	0	0(0)	0	0	0
9		7569	0.98	28	0	0	0	0	0	0	0	1	0	0	0(0)	0	0	0
10		7581	1.00	513	0	0	0	0	0	0	0	0	4	0	0(0)	0	0	0
11		7588	0.87	35	0	0	0	0	0	0	0	0	2	0	0(0)	0	0	0
12		7811	1.00	533	0	0	0	0	0	0	0	0	4	0	0(0)	0	0	0
13		7854	1.00	448	0	0	0	0	0	0	0	0	2	0	0(0)	0	0	0
14		7878	0.89	49	0	0	0	0	0	0	0	0	1	0	0(0)	0	0	0
15		7927	0.99	461	0	0	0	0	0	0	0	0	6	0	0(0)	0	0	0

	Name	Staff	Number of route read	Read SP	Unread SP	L	O	F	GO	HI	ID	NR	ZX	Z	Misread (Spot Check)	Accuracy	Upd Loc	New Meter
	Grand Total:		13.79	4386	0	1	0	0	0	0	0	6	44	0				

(1)	(2)	(3)
0.02%	0.00%	0.00%

Average inaccessible rate: (1)+(2)+(3)/Total (%): 0.02%

Annex 3
(para. 3.12(a))

Case No. 2: Site conditions



All the meters for the building were kept under lock by the caretaker.



The meter concerned was marked as being used for the whole building.